Tips for the
"Week-end Warrior:"

Controlling Erosion

UNDERSTANDING EROSION

STABILIZING SOIL...

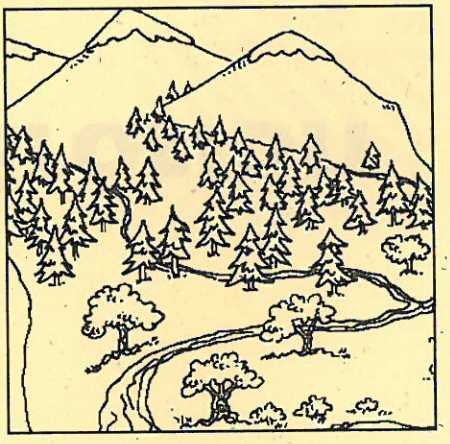
...AND PREVENTING EROSION

SEEDING BARE SLOPES & STORM DRAIN PROTECTION

PERMIT REQUIREMENTS & RESOURCES

Don't Put Off 'til Tomorrow . . .

All work which will disturb the ground surface should be done as early in the dry season as possible. Since most of Contra Costa's rain occurs between October 15th and April 15th, work should start soon after April 15th and be completed no later than October 15th. If you MUST work during the rainy season, be sure to take extra precautions to control erosion.



Understanding Erosion

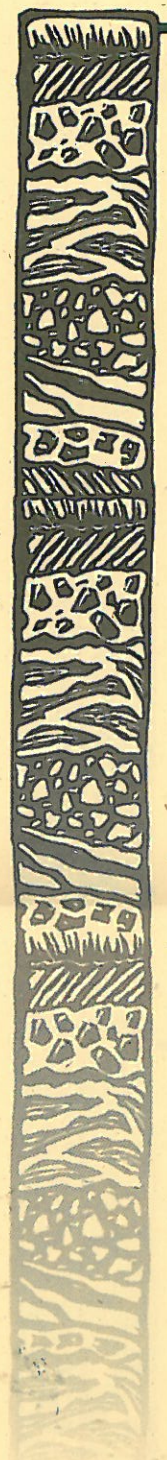
Nature slowly wears away land, but human activities increase the rate of erosion over 1,000 times. Erosion results in loss of topsoil, minerals, and nutrients, and it causes cuts and gullies in the landscape. Eroded soil is carried by stormwater runoff to local storm drain systems and creeks where it is deposited as sediment.

You can reduce erosion by protecting areas where flowing water meets bare soil, such as on freshly graded areas, dirt roads, trails and paths, driveways, earthen drainage ditches, or patches of bare or sparsely vegetated ground. In these cases, shield the soil with protective materials such as erosion control blankets, gravel, vegetative or wood mulch, or replant the area with native trees, shrubs, grasses or groundcover. This brochure discusses these and other actions you can take to help prevent erosion.

Stabilizing Soil and Preventing Erosion

Erosion can be the result of human activities (e.g. projects involving construction and grading operations, removing plants and not re-vegetating or by hiking or driving on unmarked trails and roads), natural disasters (e.g. not correcting the soil conditions after a tree is downed in a storm, slides or creek bank failures), or animal activities (e.g. livestock in stables and on pasture lands, or those trails that deer create when they come to visit your garden or use your yard as a pathway). Such activities promote erosion or loss of soil. Below are a few examples of what you can do to help prevent loss of soil.

- **Examine your site carefully before disturbing the soil.** Be aware of the slope, drainage patterns and soil types. Steep slopes, areas that may experience concentrated flows (e.g. swales, ditches, channels, etc.) and soils with high proportions of silt and very fine sand are more susceptible to erosion.
- **Preserve existing vegetation as much as possible.** When we remove vegetation or other objects that hold soil in place, we expose it to the action of wind and water and increase its chances of eroding.
- **Use fencing** to protect new plants from being damaged by foot traffic.
- **Minimize the length and steepness of slopes** by terracing or constructing diversion structures such as earthen dikes. Landscaping terraced areas will stabilize the slope and improve its appearance.
- **Consider using attractive alternatives to impervious concrete.** If you are installing a new patio or rebuilding a crumbling walkway, you don't need to use the typical slab concrete. By using bricks, interlocking pavers, or flat stones (flagstone, bluestone, or granite), you can construct an attractive, durable walkway. If placed on well-drained soil , sand or a gravel bed, modular pavers allow rainwater infiltration. To help prevent weeds from growing up between pavers, place landscape fabric on the soil before putting down your sand or gravel. You can rely on moss, another type of natural "filler" to crowd out weeds. Wood decks also serve as a form of porous pavement. Decking allows rainwater to soak into the ground beneath it. The space between the planks provides ample room for precipitation to drain directly onto the soil surface. As long as ample air space is maintained between the soil surface and the decking, wood rot can be minimized. Significant strides have been made in developing porous asphalt pavements in the last three decades. This material is similar to conventional asphalt in durability, but it contains a much smaller percentage of very fine particles. As a result, the asphalt allows water to soak through to the base material and into the soil below. Strides have also been made in the use of pervious concrete.



Stabilizing Soil and Preventing Erosion — Cont'd

- **Plant vegetation.** Vegetation is the best means of controlling soil loss because it stabilizes soil, intercepts rainfall, and takes up water. Plants also provide cover and food for wildlife. Grass provides the cheapest and most effective short-term erosion control. It grows quickly and covers the ground completely. To find the best seed mixtures and plants for your area, check with a landscape architect or your local nursery. Consider asking for native grasses. Native grasses and plants are better adapted to the local environment and require less maintenance.

- **Use mulches** to hold soil moisture and provide ground protection from rain damage. They also provide a favorable environment for starting and growing plants. Easy-to-obtain mulches include grass clippings, leaves, bark chips, shredded bark, and straw. If you use mulch near a stream, be careful not to impede the natural flow of storm waters and not place vegetation or mulch within stream channels. Straw mulch can be made more effective by punching it into the soil with a shovel or roller, or by tacking an erosion control blanket over it. Note that straw is better to use than hay because it contains less weed seeds.

- **Use erosion control mats.** Mats of jute netting, excelsior (fine curled wood shavings), or straw and coconut fibers can be effective covers that offer protection until vegetation is established or when seasonal circumstances (e.g. rain) dictate the need for temporary stabilization. To be effective, mats must be in contact with the soil and fastened securely. Ask a knowledgeable professional or salesperson for advice.

- **Watch out for roof drainage.** Roof drainage is also responsible for erosion when not properly managed. Instead of directing rainwater to bare dirt, it can be collected in barrels or storage containers or routed into lawns, planter boxes and gardens via plastic pipe. When considering these methods, make sure the water does not cause a problem where it discharges. Too much water can make the foundation unstable or could flood the crawlspace or basement. Direct rain water away from your house.

- **Reduce the force of water against the soil** by minimizing its speed and volume. This can be done by placing rocks at the point at which concentrated flows are discharged. The rocks, instead of the bare slope, will absorb the energy of the water. Be sure to place filter fabric under the rocks to prevent loss of soil.

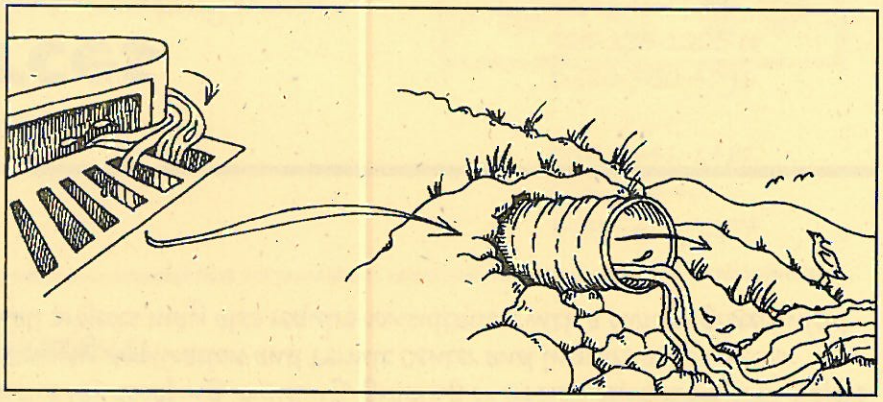
  If the volume of runoff cannot be effectively controlled, then capture it. The water can be channeled and spread to either a low-lying grassy area or a series of terraces, both of which allow gradual absorption into the soil. In more severe cases, gravel-filled seepage pits along the pavement's edge, or French drains, can be used to take in large volumes of runoff and encourage infiltration. A word of caution: re-directing water through channelization, gravel-filled pits, etc. may require the services of a civil or geotechnical engineer. It may also require a permit. (See section on permit requirements.)

"Seeding" Bare Slopes

Bare patches of land are invitations for erosion. You can ward off potential problems by employing the following activities:

- Prepare bare areas on slopes for seeding by raking the surface to loosen and roughen soil so it will hold seed. Do your seeding 4 to 6 weeks before the onset of the rainy season in October.
- Spread the seeds by hand or use a broadcast seeder. The area can also be covered with grass clippings, leaves, bark chips or straw. Even with proper timing and planting, you may need to protect disturbed areas from rainfall and keep the seeds in place until the plants have time to establish themselves. This may require use of erosion control mats for temporary cover. A professional or knowledgeable sales person can assist you in finding the proper mat to use.
- Use erosion control netting or blankets to hold soil and seeds on steep slopes.
- During dry weather irrigate until the grass is established.
- Check with your local nursery for additional information.

Storm Drain Protection



Do not rely solely on measures placed around a storm drain (such as sand bags), to keep out dirt and other sediment from eroded hillsides. It is best to seed bare slopes and take other measures to prevent erosion from occurring in the first place. **In Contra Costa, all storm drains lead directly to local creeks, bays, and the Delta.** Sediment, leaves, chemicals, etc. should not be allowed to enter storm drains. It is a misdemeanor or infraction to dispose or dump anything on the roadway or into storm drains. Violators are liable for clean-up costs and could be fined. In extreme cases, violators could be incarcerated.

Permit Requirements

The County has certain Ordinance Code requirements that address stormwater pollution controls, drainage and grading activities. These Ordinances may require property owners to obtain permits for extensive landscaping, building, grading or erosion control projects. Before you begin, contact the County Application and Permit Center and inquire as to whether permits are needed. Small projects may also require consultation with a civil or geotechnical engineer.

Resources

Federal and State Agencies

California Department of Fish and Game	707-944-5500
Regional Water Quality Control Board (Bay Area)	510-622-2346
Regional Water Quality Control Board (Central Valley)	916-646-3291
California Dept. Of Water Resources - Urban Streams Restoration Program	916-651-9625
U. S. Fish and Wildlife Service	916-414-6600
State Water Resources Control Board	916-341-5455

County Agencies

*Contra Costa Clean Water Program (Illicit Discharge Hotline)	1-800-NO-DUMPING
*County Watershed Program	925-313-2259
*County Application and Permit Center	925-335-1360
*Flood Zone Information (For unincorporated County only)	925-313-2000 or 925-335-1375
*County Public Works Department, Maintenance Division	925-313-7000
*County Flood Plain Manager	925-313-2000
Hazardous Waste Program (Emergency Spills)	925-646-2286
Recycling Hotline	925-335-1225 or 1-800-750-4096
Hazardous Waste Disposal	
Central County	1-800-646-1431
East County	925-778-4040
West County	1-888-412-9277

*Contra Costa County residents residing in incorporated cities and towns should contact their respective city agencies for this information.

Nonprofit Organizations

Urban Creeks Council	510-540-6669
California Native Plant Society	916-447-2677
San Francisco Estuary Institute	510-746-7334
Lindsey Wildlife Museum and Hospital	925-935-1978
San Francisco Bay Joint Venture	415-883-3854
the Watershed Project	510-665-3546

Contra Costa County
Public Works Department

255 Glacier Dr.
Martinez, CA
94553